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Cloud Computing

Cloud computing is Internet-based computing in which shared resources, software and information are delivered as a service that computers or mobile devices can access on demand. Cloud computing is already used extensively in education. Free or low-cost cloud-based services are used daily by learners and educators to support learning, social interaction, content creation, publishing and collaboration. Examples of cloud-based services include Google Apps, YouTube, Twitter and Dropbox.

While cloud computing has many benefits, it also involves risks, and has privacy and security implications. School authority leaders have an important role to play in making decisions about cloud-based services and in developing guidelines for use. School authority leaders, educators, IT leaders, legal counsel and FOIP coordinators should work together to balance value and risks.

This briefing provides an overview of cloud computing and explains how it differs from on-premise computing and third-party hosting arrangements. It includes some key questions to consider when making decisions about cloud computing.

Benefits

Personalized Learning – Cloud computing affords opportunities for greater student choice in learning. Using an Internet-connected device, students can access a wide array of resources and software tools that suit their learning styles and interests.

Reduced Capital Investment Costs – Cloud-based services can help schools reduce capital investment costs and accelerate the use of new technologies to meet evolving educational needs.

Comparison of On-Premise, Hosted, and Cloud-Based Services

The key distinction between on-premise, hosted and cloud-based services is the physical location of information. Cloud-based services may offer many compelling advantages over on-premise computing, such as decreased infrastructure costs and rapid deployment. However, if sensitive information is involved, the Alberta Freedom of Information and Protection of Privacy (FOIP) legislation requirements should be considered when selecting an approach. See the table on the next page for a comparison between on-premise, hosted and cloud-based services.

	On-premise	Hosted	Cloud
Physical location of servers/data	Within your jurisdiction	Known physical location outside of your jurisdiction	In one or more data centres anywhere in the world
Your control over servers/data	Full control	As per negotiated terms of agreement	Usually minimal control
Speed of implementation/ innovation	Slow to implement new solutions and upgrades to existing systems	Faster implementation but need to allocate time for contract negotiation, etc.	Can often sign up for new cloud services within minutes
Customization to meet school authority needs	Potentially fully customizable to meet specific needs[1]	Negotiate customization with hosting provider	Standardized solutions (due to economies of scale)[2]
Control over procurement/contract negotiation	Full control – deal directly with vendors	Negotiate contract terms, service level agreements	Usually must accept standard user agreement/ user terms of service
Capital Expenditures	High initial capital investment	Low capital investment[3]	Low capital investment
Operational Expenditures (maintenance and support costs)	Lower operating costs Dedicated IT staff	As per agreement with hosting provider	May be free or ongoing cost - cloud provider may change cost model with little warning

[1] *Often less flexibility/customization if using off the shelf software*
[2] *Some degree of customization may be possible, especially when customers purchase services collectively*
[3] *Unless service provider is hosting your hardware*

Choosing Between On-Premise, Hosted, and Cloud-Based Services

When choosing between on-premise, hosted or cloud-based services, consider how many people will use the service, the frequency of use and the nature of the information stored in the system.

For example, services such as Student Information Systems (SIS) are highly complex, tend to be a source of data for a number of other systems, such as transportation and assessment systems, and are used by a large number of people for critical work on a regular basis. When making decisions about these types of services, it is necessary to engage in detailed planning, thorough risk management and broad consultation. As these types of services often involve the storage and usage of sensitive personal information, the Alberta Freedom of Information and Protection of Privacy legislation requirements need to be considered. Conducting a Privacy Impact Assessment can help determine the potential privacy implications of hosting or storing your school authority's information "in the cloud."

Other types of services, such as blogs and wikis, tend to be used sporadically by a small number of people, and the information in them tends to be less sensitive. Decisions about these systems may be delegated to educators and school leaders, provided they have guidance and the skills required to evaluate the potential privacy risks of the desired service and the information they intend to work with.

The following questions can help guide school authority leaders and educators when choosing between on-premise, hosted or cloud-based services.

Key Questions for Decision-Making

Value

- What is the intended outcome your school authority is trying to achieve through this solution?
- How well does the outcome directly or indirectly support your school authority's strategic objectives?
- How extensively will the service be used?
  - Will the service be used by a large number of people or by a small group?
  - Will it be used on a daily basis or less frequently?
- What are the benefits of choosing this particular cloud-based service vs. on-premise or hosted?

Risks

- Is the information that will be accessed or stored in this system of a private or sensitive nature?
- What are the potential security risks? How can they be managed?
- How critical is the service?
  - How will your school authority respond if it is unavailable?
  - How will services be restored?
- How will your school authority recover its data if the service becomes unavailable or if your school authority wishes to move to a different service provider?
- Who owns the information within the service?

Costs (Including Infrastructure and Bandwidth Costs)

- What are the initial costs of implementation? (e.g., hardware, IT staff hours, staff training)
- What are the ongoing operational costs, including the cost of support?
- What assurance can the vendor provide that rates will not be subject to sudden, substantial increases?
- If involved data is used by other systems, what are the integration costs?

Next Steps

- Discuss the above questions with other leaders and compliance staff at your school authority when making decisions about cloud-based services.
- Consider developing guidelines for educators and school leaders that will help them:
  - evaluate the potential privacy risks of cloud-based services; and
  - determine which services staff can make decisions about themselves vs. which services may require additional involvement of senior leaders, FOIP coordinators, legal counsel and/or IT leaders.

Questions?

Contact Tara Reimche, Technology Planning
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Additional Resources

Office of the Information and Privacy Commissioner of Alberta (OIPC)
http://www.oipc.ab.ca

Private Impact Assessment Requirements
http://bit.ly/PIARequirements

OIPC Outsourcing Guide
http://bit.ly/oipcoutsourcing

School Technology Services (STS) Program
The STS Program supports school authorities in identifying the critical capabilities required for effective decision-making about technology investments and technology-related risk.
http://bit.ly/stsprogram